CLAIMS

1. Lock, especially for automobile doors, hatches, etc.,

-- with a rotary latch (10), which has a prelatching element (12) and a main latching element (13) and which is spring-loaded (32) in the direction toward its open position (10.1), in which the door is open;

-- with a stationary pin, yoke (30), or the like, which, as the door is being closed, travels into the rotary latch (10), thus pivoting the latch into a prelatching position (10.2), where a spring-loaded (22) pawl (20) drops into the prelatching element (12) of the rotary latch (10);

-- with a combination motorized closing and opening aid for the door, comprising a gear with two takeoff elements (50, 60), which can be put into motion simultaneously, and a control unit;

-- where, by means of the control unit, the first takeoff element functions as a closing element (50) with the gear turning in one direction (44) as the door is being pulled shut, the rotary latch (10) thus being pivoted out of its prelatching position (10.2) into the main latching position (10.3);

-- where the pawl (20) drops into the main latching element (13) of the rotary latch (10) and the door is closed; and

-- in the other direction of rotation, i.e., with the gear

turning in the opposite direction (45), the second takeoff element functions as an opening element (60) as the door is being opened, the pawl (20) thus being lifted up out of the rotary latch (10);

-- as a result of which the released rotary latch (10) rotates back into its open position (10.1) under the effect of its spring-loading (32),

characterized in that

-- the two takeoff elements (50, 60) are seated with a certain axial offset from each other on a common takeoff wheel (40); in that

-- the closing element (50) is located in the lock in a first plane of rotation, namely, in a closing plane; in that

-- the opening element (60) responsible for the opening process lies in a second plane of rotation in the lock, namely, in an opening plane, which is axially offset from the first plane of rotation; in that

-- for the closing element (50), the rotary latch (10) has a driver (14) located in the closing plane, the driver being located outside the path of rotation (51) of the closing element (50) when the rotary latch (10) is in the open position (10.1); in that

-- conversely, the driver (14) is located in the path of rotation (51) of the closing element when the rotary latch (10) is in the prelatching position (10.2) and also when it is in the main latching position (10.3); in that

-- a release finger (23) for the opening element (60) is seated on the pawl (20), the release finger being located in the opening plane; and in that

-- the opening element (60) is mounted with spring-loading (63) in the takeoff wheel (40) and, as a result of its spring-loading (63), shifts automatically between a retracted position (61.2), in which it is inactive with respect to the release finger (23), and an extended position (61.1), in which it is active with respect to the release finger (23).

2. Lock according to Claim 1, characterized in that the takeoff wheel (40) is turned by the control unit in two directions of movement (44, 45) between two stable end positions (40.1, 40.2), namely, between a closed end position (40.2) when the door is closed and an open end position (40.1) when the door is open.

3. Lock according to Claim 1 or Claim 2, characterized in that the closing element (50) is located outside the plane of rotation of the takeoff wheel (40).

4. Lock according to one of Claims 1-3, characterized in that the opening plane of the opening element (60) is located at least partially in the plane of rotation of the takeoff wheel (40).

5. Lock according to one or more of Claims 1-4, characterized in that the closing element is formed by a cam (closing cam 50) projecting from the takeoff wheel (40), and the driver is formed by a driver tooth (14) projecting from the rotary latch (10).

6. Lock according to Claim 5, characterized in that the closing cam (50) projects axially from the end surface (46) of the takeoff wheel (40).

7. Lock according to Claim 5 or Claim 6, characterized in that the rotary latch (10) lies in the closing plane, and its driver tooth (14) is formed by a profiled part on the periphery of the rotary latch (10).

8. Lock according to one of Claims 5-7, characterized in that at least the locking point (21) of the pawl (20) which drops into the prelatching element (12) or main latching element (13) of the rotary latch (10) lies in the closing plane, whereas the release finger (23) lies in the offset opening plane.

9. Lock according to one or more of Claims 1-8,

characterized in that the spring-loaded opening element (60) is in its retracted position (61.2) only when the takeoff wheel (40) is in the area of the open end position (40.1).

10. Lock according to one or more of Claims 1-9, characterized in that the spring-loaded opening element consists of a slider (60), which can slide longitudinally in the takeoff wheel (40), where the end (61) of the slider tries to reach the extended position (61.1) under the action of its spring-loading (63).

11. Lock according to Claim 9, characterized in that, when the end (61) of the slider is in the extended position (61.1), it projects radially beyond the periphery of the takeoff wheel (40).

12. Lock according to Claim 10 or Claim 11, characterized in that the takeoff wheel (40) has a channel (35) for the longitudinal guidance of the slider (60).

13. Lock according to Claim 12, characterized in that the guide channel (35) extends essentially along a diameter of the takeoff wheel (40).

14. Lock according to one or more of Claims 1-13, characterized in that, at least in the normal case, the end (61) of the slider and the closing cam (50) are both located in

essentially the same angular region of the takeoff wheel (40).

15. Lock according to one or more of Claims 1-14, characterized in that the takeoff wheel (40) consists of two movable disks (41, 42), namely, a slider disk (42), which holds the opening element or the slider (60), and a disk with the closing element or with the closing cam (50), namely, a cam disk (41), the two disks being able to rotate relative to each other to a limited extent under certain conditions.

16. Lock according to Claim 15, characterized in that the rotary drive of the takeoff wheel (40) acts on the slider disk (42); in that

-- the rotation of the slider disk (42) is transmitted to the cam disk (41) by means of an intermediate coupling; in that

-- the coupling, upon rotation of the slider disk (42) in the one direction, namely, the direction (44) which determines the door-closing process, always carries the cam disk (41) along with it; and in that

-- upon rotation of the slider disk (42) in the reverse direction (45), i.e., the direction which determines the opening process, the cam disk (41) can be disconnected under certain conditions and thus will rest, whereas the slider disk (42), when disconnected from the cam disk, will continue to rotate in

reverse (45) by itself.

17. Lock according to Claim 16, characterized in that, between the two disks (41, 42) there is a torsion spring, which tries to turn the disconnected cam disk (41) back into a defined starting rotational position with respect to the slider disk (42).

18. Lock according to Claim 16 or Claim 17, characterized in that the coupling consists of a rotational guide (17, 27), and in that

-- a rotational stop (48) is located at one end of the rotational guide (17, 27).

19. Lock according to Claim 17 or Claim 18, characterized in that the spring located between the two disks (41, 42) tries to bring the rotational guide (17, 47) into contact with the rotational stop (48).

20. Lock according to Claim 18 or Claim 19, characterized in that the rotational guide consists of

-- a pin (17) on the slider disk (42) or on the cam disk; and of

-- a slot (47), in the form of a ring segment, in the cam disk (41) or in the slider disk, in which the pin (17) is guided.

21. Lock according to one or more of Claims 1-20, characterized in that, during the motorized closing process, the takeoff wheel (40) continues to turn beyond the position where the locking point (21) of the pawl (20) is aligned with the main latching element (13) of the rotary latch (10) until it reaches the closed end position (40.2) and thus produces a so-called overstroke (54), and in that, during this overstroke (54), the pawl (20) has sufficient time to drop reliably behind the main latching element (13) of the rotary latch (10).

22. Lock according to Claim 21, characterized in that, when the takeoff wheel (40) is in the closed end position (40.2), the closing cam (50) grips the tip (25) of the driver tooth (14) of the rotary latch (10).

23. Lock according to Claim 22, characterized in that, in a so-called "snow load situation", where, after reverse rotation of the takeoff wheel (40) in the reverse direction (45), the spring-loading (32) is not sufficient to pivot the released rotary latch (10) back into its open position (10.1), the closing cam (51), upon reverse rotation (45) of the takeoff wheel (40), strikes the tip (25) of the driver tooth (14) and stops the further accompanying rotation of the cam disk (41); in that, however,

-- the slider disk (42) continues to turn back until it reaches the open end position (40.1), during which the cam disk (41) becomes disconnected in the rotational guide (17, 47) and tensions the torsion spring; and in that

-- the end (61) of the slider continues to be arrested in its extended position (61.1) and thus, upon reverse rotation (45) of the slider disk (42), lifts the pawl (40) out of the rotary latch (10) and then holds it in the lifted-out position (20.2)

-- until the free rotary latch (10) has pivoted back into its open position (10.1).

24. Lock according to Claim 23, characterized in that, after the rotary latch (10) has pivoted back, the end (61) of the slider is pushed back by the pawl (20) into its retracted position (61.2) in the slider disk (42).

25. Lock according to Claim 23 or Claim 24, characterized in that

-- the slider (60) has a support surface (65), which faces in the direction opposite that of its spring-loading (63); in that

-- a guide segment (55) in the form of at least a part of a circle on the cam disk (42) is assigned to the support surface

(65), the partial circle being essentially coaxial to the axis of rotation (27) of the disk; in that

-- the support surface (65) is normally outside the guide segment (55) and thus allows the slider (60) to be pressed inward; in that, however,

-- in the snow load situation, upon reverse rotation of the slider disk (42), the support surface (65) slides along the guide segment (55) of the resting cam disk (41) until the slider disk (42) reaches the open end position (40.1); in that

-- the support surface (65) resting on the guide segment (55) arrests the end (61) of the slider in its extended position (61.1) until the spring-loaded rotary latch (10) has pivoted back into its open position (10.1); and in that

-- in the open position (10.1) of the rotary latch, the slider (60) can be pressed in again when the torsion spring of the rotational guide (17, 47) has turned the cam disk (41) back so far that the support surface (65) on the slider (60) has traveled beyond the guide segment (55) on the cam disk (41).

26. Lock according to Claim 25, characterized in that the guide segment (55) is provided by the periphery of the cam disk (42).

27. Lock according to Claim 24 or Claim 25, characterized

in that

-- the channel (35) serving to guide the longitudinal travel of the slider (60) is located in the slider disk (42); in that

-- the end (61) of the slider has a projection (axial projection 64) extending beyond the thickness of the slider disk (60) in a direction parallel to the axis of rotation (27); in that

-- a channel extension (28) on the inside surface (26) of the cam disk (41) is assigned to the slider projection (64),

-- into which channel extension the axial projection (64) normally travels when the slider (60) moves into its retracted position (61.2); in that

-- the partial segment (55) of a circle on the cam disk (41) is adjacent to the channel extension (28); and in that

-- a shoulder surface between the axial projection (64) at the end (61) of the slider forms the support surface (65), which is supported against the cam disk (41) in the snow load situation.